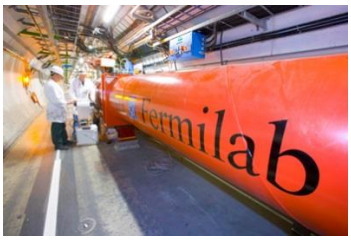
Forefront Research

NOvA

Fermilab is at the forefront of research into neutrinos, ubiquitous but hard-to-catch particles that might point us to a better understanding of the first moments after the Big Bang. Fermilab's current flagship neutrino experiment, NOvA sends a beam of neutrinos to a 14,000-ton particle detector a record-breaking 500 miles away in Minnesota. NOvA aims to study the oscillation of muon neutrinos to electron neutrinos, to determine the ordering of neutrino masses and to discover whether neutrinos and antineutrinos oscillate at different rates.
http://www.fnal.gov/pub/science/particle-physics/index.html

DUNE/LBNF

The Deep Underground Neutrino Experiment, DUNE, is a proposed international neutrino experiment that would be the largest of its kind. DUNE aims to make definitive determinations of neutrino properties, the dynamics of the supernovae that produced the heavy elements necessary for life and the possibility of proton decay. DUNE research will be conducted with the international Long-Baseline Neutrino Facility, LBNF, at Fermilab and the Sanford Underground Research Facility in South Dakota.
http://www.fnal.gov/pub/science/particle-physics/index.html



LHC/CMS

For almost two decades, Fermilab and its scientists have played a significant role in the LHC and particularly in the CMS experiment. Fermilab also provides scientific, technical and organizational support for the 630 scientists

and graduate students from 47 US universities and laboratories that participate in the 2,600-member international CMS collaboration. Scientists working on the CMS experiment, together with scientists from the ATLAS experiment, announced the discovery of the Higgs boson in 2012. Today they continue their forefront research, using particle collisions to investigate the properties of the Higgs boson and other particles and forces.
http://www.fnal.gov/pub/science/particle-physics/index.html

Dark Matter/Dark Energy

Fermilab scientists are at the cutting edge of research in dark matter and dark energy, which helped shape the universe and will continue to guide its evolution into the future. Fermilab is a base for exploration of the fundamental particles and forces that govern our world on the smallest scales.
http://www.fnal.gov/pub/science/particle-physics/index.html